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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/806,107	03/23/2004	Yong-Jin Ahn	1293.1278C2	1886
49455 7590 03/19/2007 STEIN, MCEWEN & BUI, LLP 1400 EYE STREET, NW SUITE 300 WASHINGTON, DC 20005			EXAMINER CHOW, LIXI	
			ART UNIT	PAPER NUMBER
			2627	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		03/19/2007	PAPER	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/806,107

Applicant(s)

AHN ET AL.

Examiner

Lixi Chow

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 December 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 20 is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-8, 17 and 19 is/are rejected.
- 7) ☒ Claim(s) 5, 9-16 and 18 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

1. Claims 1-20 are pending in this application.
2. The terminal disclaimer filed on 12/26/06 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of any patent granted on Application no. 10/806,318 has been reviewed and is accepted. The terminal disclaimer has been recorded.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claim 19 is rejected under 35 U.S.C. 102(e) as being anticipated by Ichihara (US 6,396,792).

Regarding claim 19:

Ichihara discloses an apparatus (see Fig. 5) for recording data on an optical recording medium, comprising:

a recording waveform generating unit (Fig. 5, element 26) which generates a recording waveform having an erase pattern containing a leading pulse and a multi-pulse having a high power level and a low power level and a recording pattern containing another multi-pulse, a power level of the leading pulse of the erase pattern being the high power level of the multi-pulse and a power level of a period between an end point of the erase pattern and a start point of a

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leading pulse of the recording pattern being the high power level of the multi-pulse (see Fig. 1B and col. 6, line 62 to col. 7, line 5; Ichihara suggests that power level of a period between the end of the erase pattern and the beginning of the recording pattern can be set from Pc1 to Pa, Pc2 to Pa, or Pc to Pa; when the power level of the period is set from Pc1 to Pa, the power level of the period is set to be the high power level of the multi-pulse); and

a pickup unit (Fig. 5, element 13) which generates light to the optical recording medium according to the generated recording waveform so that a mark or a space is formed on the optical recording medium.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-4, 6 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohno et al. (US 5,150,351; hereafter Ohno) in view of Ichihara (US 6,396,792).

Regarding claim 1:

Ohno discloses an apparatus (see Fig. 6) for recording data on an optical recording medium, comprising:

a recording waveform generating unit (see Fig. 6, element 3) which generates a recording waveform having an erase pattern containing a leading pulse and a multi-pulse having a high power level and a low power level and a recording pattern containing recording pulses (see Fig.

4(b)), a power level of the leading pulse of the erase pattern being the low power level of the multi-pulse (see Fig. 4(b)); and

a pickup unit (see Fig. 6, elements 5 and 6) which generates light to the optical recording medium according to the generated recording waveform so that a mark or a space is formed on the optical recording medium.

Ohno fails to disclose the power level of a period between an end point of the erase pattern and a start point of a leading pulse of the recording pattern being the high power level of the multi-pulse. However, Ichihara discloses an apparatus for recording data on an optical recording medium, the apparatus comprising:

a recording waveform generating unit (see Fig. 5, element 26) which generates an erase pattern containing a leading pulse and a multi-pulse having a high power level and a low power level and a recording pattern containing recording pulses, a power level of a period between an end point of the erase pattern and a start point of the leading pulse of the recording pattern being the high power level of the multi-pulse (see Fig. 1B and col. 6, line 62 to col. 7, line 1; the example provided by Ichihara, i.e., the level may be changed from  $P_{c1}$  to  $P_a$ , suggests that the power level of a period between an end point of the erase pattern and a start point of the recording pattern is the high power level of the multi-pulse).

At the time the invention was made, it would have been obvious to one skilled in the art to modify the apparatus of Ohno, so that the power level of a period between an end of the erase pattern and the start of the recording pattern is the high power level of the multi-pulse as suggested by Ichihara. One of ordinary skill in the art would have been motivated to do this because having a high power level of the multi-pulse between the end of the erase pattern and the

start of the recording pattern will ensure the entire area in the width direction of the recording track uniformly passes the temperature zone promoting generation of crystal nuclei (see col. 7, lines 1-5).

Regarding claim 2:

Ohno discloses the apparatus, further comprising: a channel modulation unit (see Fig. 6, element 2) which channel modulates data provided from an outside source, and outputs an NRZI data signal to the recording waveform generating unit (see Fig. 4(a)).

Regarding claim 3:

Ohno discloses the apparatus, wherein the pickup unit comprises:

a motor (see Fig. 6, element 6) which rotates the optical recording medium;

an optical head (Fig. 6, element 5) having a laser device which generates a laser beam to the optical recording medium or receives the laser beam reflected from the optical recording medium;

a servo circuit which servo-controls the motor and the optical head; and a laser driving circuit which drives the laser device installed in the optical head (the optical pickup unit of Ohno inherently includes a servo circuit and a laser driving circuit).

Regarding claim 4:

Claim 4 recites similar limitations as in claim 1. In addition to claim 1, Ohno further discloses a cooling pulse concatenating the recording and erase patterns (see Fig. 4(b); the cooling pulse is the low power level that connects the recording pattern and the erase pattern). Accordingly, claim 4 is rejected under the same reasons set forth in claim 1.

Regarding claim 6:

Ohno does not, but Ichihara discloses the apparatus wherein the generating unit adjusts the period of the recording pattern to be the high power level according to a pulse of the multi-pulse of the erase pattern (see col. 6, line 62 to col. 7, line 1; the example provided by Ichihara, i.e., the level may be changed from  $P_{c1}$  to  $P_a$ , suggests that the power level of a period between an end point of the erase pattern and a start point of the recording pattern is adjusted to the high power level of the multi-pulse).

The reason to combine the teachings is same as the reason provided in the claim 1.

Regarding claim 17:

Ohno discloses the apparatus, wherein the cooling pulse has a cooling power less than a power of a last pulse of the recording pattern and/or the low power level of the leading pulse of the erase pattern (see Fig. 4(b), the cooling pulse  $P_r$  is less than the power  $P_p$ , which is the power of the last pulse of the recording pattern).

7. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohno in view of Ichihara as applied in claim 1, and further in view of Clark et al. (US 5,802,031; hereafter Clark).

Regarding claim 7:

Claim 7 recites similar limitations as in claim 1; hence the features that are similar to claim 1 are being met by Ohno and Ichihara references.

Ohno and Ichihara do not disclose the data recorded using the waveform modulated according to a Run Length Limited (RLL) (1,7). However, Clark discloses the recording of data using the waveform modulated according to a Run Length Limited (RLL) (1,7) (see Clark, col. 6, lines 51-59).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have adopted the method of recording data according to a Run Length Limited (RLL) (1,7) in the apparatus of Ohno as taught by Clark. One of ordinary skill in the art would have been motivated to do this, because recording of marks and spaces of length 2T to 8T for standard M-O recording system is possible (see Clark, col. 6, lines 51-59). Hence, recording of marks or spaces amongst different types of recording format can be achieved.

Regarding claim 8:

Claim 8 recites similar limitations as in claim 7; hence claim 8 is rejected under the same reason set forth above in claim 7.

#### *Response to Arguments*

8. Applicant's arguments filed 12/26/06 with respect to claim 19 have been fully considered but they are not persuasive. Applicant argues, "Ichihara does not disclose or suggest, among other features a power level of the leading pulse of the erase pattern being the high power level of the multi-pulse and a power level of a period between an end point of the erase pattern and a start point of a leading pulse of the recording pattern being the high power level of the multi-pulse". However, Examiner respectfully disagrees. Ichihara suggests since a period between an end point of the erase pattern and a start point of a leading pulse of the recording pattern is changed from Pc1 to Pa, then the time between the first pulse and the last off pulse of the amorphous mark can be adequately determined (see col. 6, line 64 to col. 7, line 1). By proving the example that first pulse the recording pattern, i.e., the period between the end point of the erase pattern and a start point of the recording pattern, may be from Pc1 to Pa, Ichihara shows



that the period between the end of the erase pattern and the start of the recording pattern is a high power level. Accordingly, claim 19 is not patentable over Ichihara.

Applicant's arguments with respect to claims 1-4, 6-8 and 17 have been considered but are moot in view of the new ground(s) of rejection.

*Allowable Subject Matter*

9. Claim 20 is allowed.

In regards to claim 20, none of the reference of record alone or in combination disclose or suggest an apparatus for recording data on an optical recording medium, comprising: a recording waveform generating unit which generates a recording waveform having an erase pattern containing a leading pulse and a multi-pulse having a high power level and a low power level, a recording pattern containing another multi-pulse, and **a cooling pulse having a cooling power level below the low power level** and which concatenates the recording and erase patterns, a power level of the leading pulse of the erase pattern being the low power level of the multi-pulse and a power level of a period between an end point of the erase pattern and a start point of a leading pulse of the recording pattern being the low power level of the multi-pulse; and a pickup unit which generates light to the optical recording medium according to the generated recording waveform so that a mark or a space is formed on the optical recording medium.

10. Claims 5, 9-16 and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

In regards to claims 5, 13, 16 and 18, none of the reference of record alone or in combination disclose the apparatus wherein the recording waveform generating unit generates a

further multi-pulse of another recording pattern, and a **cooling pulse having a cooling power level less than the low power level of the multi-pulse** connecting the leading pulse of the erase pattern and another portion of the further multi-pulse of the another recording pattern.

In regards to claim 9-12, none of the reference of record alone or in combination disclose or suggest the apparatus wherein the recording waveform comprises another recording pattern formed of a further multi-pulse including the leading pulse of the recording pattern, the further multi-pulse comprising corresponding high power recording pulses with a high recording power level and low power recording pulses having a low recording power level, the high recording power level being greater than the high power level of the erase pattern, **an the low recording power level being less than the low power level of the erase pattern.**

Claims 13-15 depend from claims 9 and/or 10; hence they are objected under the same reasons set forth in claims 9 and/or 10.

### *Conclusion*

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lixi Chow whose telephone number is 571-272-7571. The examiner can normally be reached on Mon-Fri, 8:30am to 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on 571-272-7582. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LC 3/16/07



WAYNE YOUNG  
SUPERVISORY PATENT EXAMINER